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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/730,557	12/08/2003	William Albert Challenger	S01.12-1278 / STL 11475	1515
27365 7590 05/29/2008 SEAGATE TECHNOLOGY LLC C/O WESTMAN CHAMPLIN & KELLY, P.A. SUITE 1400 900 SECOND AVENUE SOUTH MINNEAPOLIS, MN 55402-3244				
EXAMINER				
GOMA, TAWFIK A				
ART UNIT		PAPER NUMBER		
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05/29/2008		PAPER		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/730,557

**Applicant(s)**

CHALLENGER ET AL.

**Examiner**

TAWFIK GOMA

**Art Unit**

2627

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 19 February 2008.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SD/US)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

### DETAILED ACTION

This action is in response to the amendment filed on 2/19/2008.

#### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-2, 6-12, and 15-20 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Rottmayer et al (US 2003/0198146) in view of Matsushima et al (US 6937799).

Regarding claim 1, Rottmayer discloses a data recording head for use in conjunction with a data recording medium (fig. 3). Rottmayer further discloses using a waveguide (50, fig. 3). Rottmayer fails to disclose a first waveguide supported by the body and a second waveguide supported by the body and energy-coupled to the first waveguide. In the same field of endeavor, Matsushima discloses a first waveguide supported by a body (22, fig. 5); and a second waveguide supported by the body and energy-coupled to the first waveguide (Shaded elements adjacent to element 22, i.e. last shaded element of section 11, fig. 5), wherein the first waveguide and the second waveguide are separated by a spacing (Space in direction of arrow 3, fig. 5), wherein the first waveguide has a first width and the second waveguide has a second width, the first width and the second width being measured in the direction of the space between the first waveguide and the second waveguide, and wherein the first width is larger than the second width (Width in direction of arrow 3 of element 22, fig. 5 larger than width of other shaded waveguides, i.e. last waveguide on far left in section 11). It would have been obvious

to one ordinary skill in the art to modify the data recording head disclosed by Rottmayer by providing the waveguide taught by Matsushima. The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have been motivated to provide a first and second waveguide in order to efficiently couple and reduce the spot sized of a beam emitted from a single mode fiber.

Regarding claim 12, Rottmayer discloses a data storage system, comprising: a data recording medium (fig. 3); a radiant energy source (52, fig. 3); a data recording head (22, fig. 3), comprising: a body (22, fig. 3), a waveguide supported by the body and coupled to the radiant energy source (50, fig. 3), the waveguide directing radiant energy to the data recording medium (fig. 3 and par. 25); and an actuator supporting and positioning the data recording head with respect to the data recording medium to effect data recording (28, fig. 2). Rottmayer fails to disclose a first waveguide and a second waveguide that is coupled to the first waveguide. In the same field of endeavor, Matsushima discloses a first and second waveguide that are energy coupled, with a larger width for the first waveguide (22, 11, fig. 5 as applied in claim 1 above). The motivation for combining follows as in claim 1 above.

Regarding claim 2, Matsushima further discloses wherein the first waveguide is configured to couple input radiant energy from an external source (col. 1 lines 19-26).

Regarding claim 6, Matsushima further discloses wherein the first waveguide corresponds to an input spot size and the second waveguide corresponds to an output spot size, wherein the input spot size is larger than the output spot size (D, A, fig. 5 and col. 8 lines 64-67).

Regarding claim 7, Matsushima further discloses wherein the input radiant energy is coupled from the first waveguide to the second waveguide across the space between the first waveguide and the second waveguide (fig. 5).

Regarding claim 8, Matsushima further discloses an index matching layer between the first and second waveguides for facilitating mode index matching between the first and second waveguides (col. 3 lines 43-47).

Regarding claims 9 and 15, Matsushima further discloses wherein the index matching layer includes at least one of a cladding layer and a diffraction grating (col. 3 lines 43-47).

Regarding claims 10 and 16, Matsushima discloses a first and second waveguide as applied above. Rottmayer further discloses wherein a waveguide comprises a solid immersion optical element that is configured to focus radiant energy as an output (par. 27).

Regarding claim 11, Matsushima discloses a first and second waveguides as applied above. Rottmayer discloses a write element to effect magnetic data recording, wherein the waveguide the configured relative to the write element to effect heat assisted magnetic recording (fig. 3 and par. 25).

Regarding claim 17, Matsushima discloses a first and second waveguide as applied above. Rottmayer further discloses wherein the data recording medium includes a magnetic data recording medium (16, fig. 3) and wherein the data recording head further comprises a write element to effect magnetic data recording on the magnetic data recording medium (22, fig. 3 and par. 25), wherein the waveguide is configured relative to the write element (50, fig. 3) and the data recording head is supported and positioned by the actuator relative to the data recording medium to effect heat assisted magnetic recording (pars 22 and 25 and 28, fig. 2).

Regarding claim 18, Rottmayer discloses a method of data recording (par. 25), comprising the steps of: providing a radiant energy source (52, fig. 3); providing a data recording head comprising a first waveguide coupled to the radiant energy source (54, 50, fig. 3) directing radiant energy at a spot on the data recording medium (A, fig. 3 and par. 25); and recording data at the spot where radiant energy has been directed (par. 42). Rottmayer fails to disclose a first and second waveguide, wherein a second waveguide is energy-coupled to the first waveguide and configured to direct radiant energy. In the same field of endeavor, Matsushima discloses a first and second waveguide that are energy coupled for directing radiant energy, with the first waveguide having a larger width as applied to claim 1 above (22, 11, Fig. 5). The motivation for combining follows as in claim 1 above.

Regarding claim 19, Matsushima further discloses wherein a radiant energy source produces input radiant energy corresponding to a first spot size (col. 1 lines 19-26), wherein the second waveguide is configured to direct output radiant energy having a second spot size, which is smaller than the first spot size (D, A, fig. 5 and col. 8 lines 64-67).

Regarding claim 20, Rottmayer further discloses wherein the step of recording data includes magnetic data recording (par. 25).

Claims 3-5 and 13-14 are rejected under 35 U.S.C. 103 (a) as being unpatentable over Rottmayer et al (US 2003/0198146) in view of Matsushima et al (6937799) as applied to claims 1-2, 6-12 and 15-20 above, and further in view of Dawes et al (6744951).

Regarding claims 3 and 13, Rottmayer in view of Matsushima fail to disclose wherein the first waveguide is configured to end fire couple to the input radiant energy. In the same field of endeavor, Dawes discloses a waveguide that is end fire coupled to an optical fiber (col. 11 lines

35-38). It would have been obvious to one of ordinary skill in the art at the time of the applicant's invention to modify the recording head ad system disclosed by Rottmayer in view of Matsushima by end fire coupling the waveguide to the energy source as taught by Dawes. The rationale is as follows: One of ordinary skill in the art at the time of the applicant's invention would have been motivated to end fire couple the waveguide with the energy source in order to maximize UV power coupling into the planar waveguides.

Regarding claims 4 and 14, Matsushima further discloses wherein the input radiant energy corresponds to a first spot size, and the first waveguide has a first width that is sized to substantially correspond to the first spot size (col. 1 lines 19-26 and 3, fig. 5).

Regarding claim 5, Matsushima further discloses wherein the second waveguide is configured to output radiant energy corresponding to a second spot size (D, fig. 5 and col. 8 lines 64-67).

### ***Response to Arguments***

Applicant's arguments with respect to claims 1-20 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to TAWFIK GOMA whose telephone number is (571)272-4206. The examiner can normally be reached on 8:30 am - 5:00 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Joseph Feild can be reached on (571) 272-4090. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Joseph H. Feild/  
Supervisory Patent Examiner, Art Unit  
2627

/Tawfik Goma/  
Examiner, Art Unit 2627